MODEL SP 18SA

1. PRECAUTIONS IN DISASSEMBLY AND REASSEMBLY

The **[Bold]** numbers in the descriptions below correspond to the item numbers in the Parts List and exploded assembly diagram for SP 18SA.

1-1. Disassembly of the Armature Ass'y and the Lock Lever Ass'y

(1) Loosen the two Brush Caps **[27]**, and take out the Carbon Brushes **[26]**.

(2) Remove the four Tapping Screws D5 x 55 **[7]**, and remove the Gear Cover **[8]**, and related parts.
The Armature Ass'y **[17]** can then be taken out together with the Inner Cover **[12]**, the Lock Lever **[14]** , and related parts.

(3) As illustrated in Fig. 1, the Inner Cover **[12]**, and related parts can be removed from the Armature Ass'y **[17]**, and related parts by utilizing a J-130 sleeve (special repair tool, Code No. 970907) and a J-131 plate (special repair tool, Code No. 305711).

(4) The Ball Bearing **[13]** can be removed from the Armature Ass'y **[17]** by utilizing the J-30 bearing puller ass'y (special repair tool, Code No. 970804).
After the Ball Bearing has been removed, the Lock Lever **[14]** can be easily taken off.

(5) As illustrated in Fig. 2, the Ball Bearing **[19]** can also be removed from the Armature Ass'y **[17]** by utilizing the J-130 sleeve (special repair tool, Code No. 970907) and a J-204 bearing puller (special repair tool, Code No. 970982).
After the Ball Bearing has been removed, the Dust Seal **[18]** can be easily taken out.

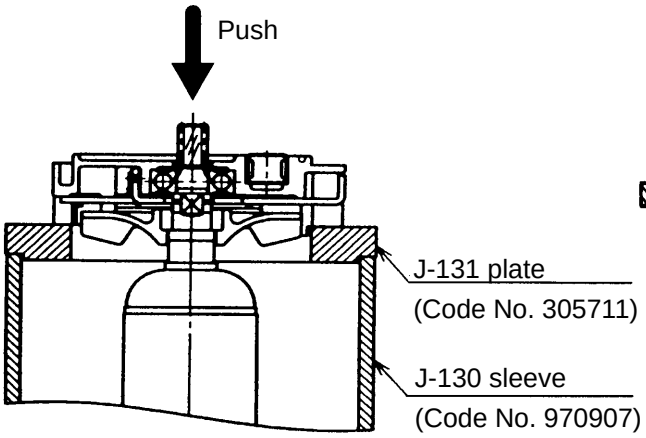


Fig.1

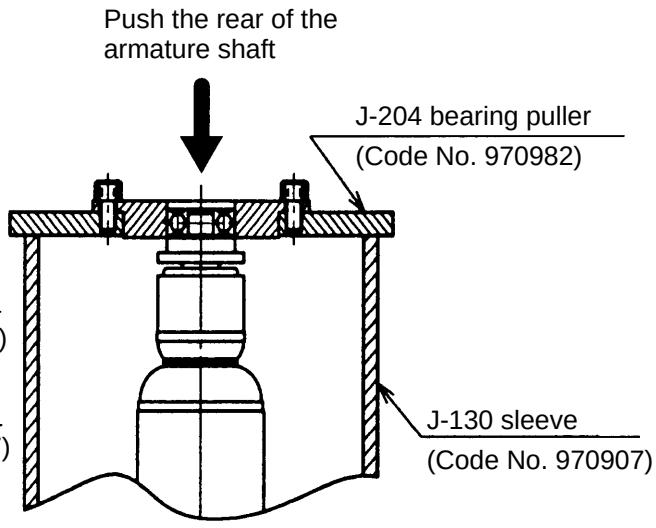


Fig.2

1-2. Disassembly of the Stator Ass'y

(1) After taking off the Armature Ass'y **[17]**, loosen the five Tapping Screws D4 X 20 **[30]** and remove the Tail Cover **[29]**, the Handle Cover **[33]** and the Fan Guide **[20]**.

(2) Disconnect the lead wires of the Stator Ass'y **[21]** from Switch (C) **[37]**.
Then, disconnect the lead wires of Noise Suppressor **[34]**.

(3) Disconnect the Brush Terminals **[22]** from the Brush Holders **[25]**.

(4) Loosen the two Hex. Hd. Tapping Screws **[31]**, and remove the lead wire of the Noise Suppressor **[34]**. And pull out the lead wires of the Stator Ass'y **[21]** from the Housing Ass'y **[23]**. Then, the Stator Ass'y can be taken out of the Housing Ass'y **[23]**. If the Stator Ass'y **[21]** cannot be easily taken out of the Housing Ass'y **[23]**, disassembly can be facilitated by heating the Housing Ass'y to a temperature of approximately 60 ˚C (140 ˚F) in an appropriate heating oven.

1-3. Disassembly of the Final Gear and the Ball Bearing

(1) Loosen the four Tapping Screws D5 x 55 **[7]**, and remove the Gear Cover **[8]**, together with the Spindle **[4]**, the Final Gear **[16]**, and the related parts as a single unit. Then, the Second Pinion **[10]** and Washer **[11]** can be removed easily.

(2) Remove the Bearing Caps **[3]** with the J-21 wrench.

(3) As illustrated in Fig. 3, support the tip of the Gear Cover **[8]** with a cylindrical jig of inside diameter 35 mm or more, and push the rear portion of the Spindle **[4]**. At this time, the Final Gear **[16]** will come off of the Spindle.

(4) Remove the D12 Retaining Ring **[6]** from the Spindle **[4]**, and the Ball Bearing **[5]** can be removed from the Spindle **[4]** with the J-30 bearing puller ass'y (special repair tool, Code No. 970804).

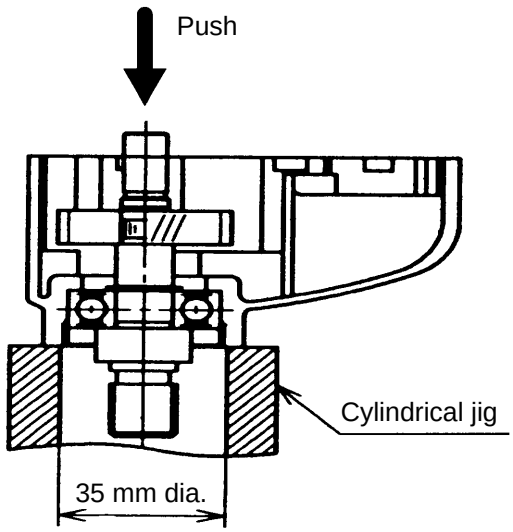


Fig. 3

1-4. Reassembly

Perform reassembly in the reverse order of disassembly while ovserving the given precautions and taking care of the following points.

(1) After disassembly, thoroughly remove old grease from the inside of the Gear Cover **[8]**, and insert 30 g of new grease (Nippeco JF-375, Code No. 930036, is recommended) prior to reassembly. When inserting grease, apply it to the pinion gear teeth surfaces, and to the needle bearing inside the Inner Cover **[12]**.

(2) When replacing the Ball Bearing **[19]** on the commutator side of the Armature Ass'y **[17]**, be very careful to ensure that the Dust Seal **[18]** is assembled in the proper direction. The Dust Seal **[18]** plays an important role in protecting the ball bearing against dust, and must be replaced with a new one if disassembled.

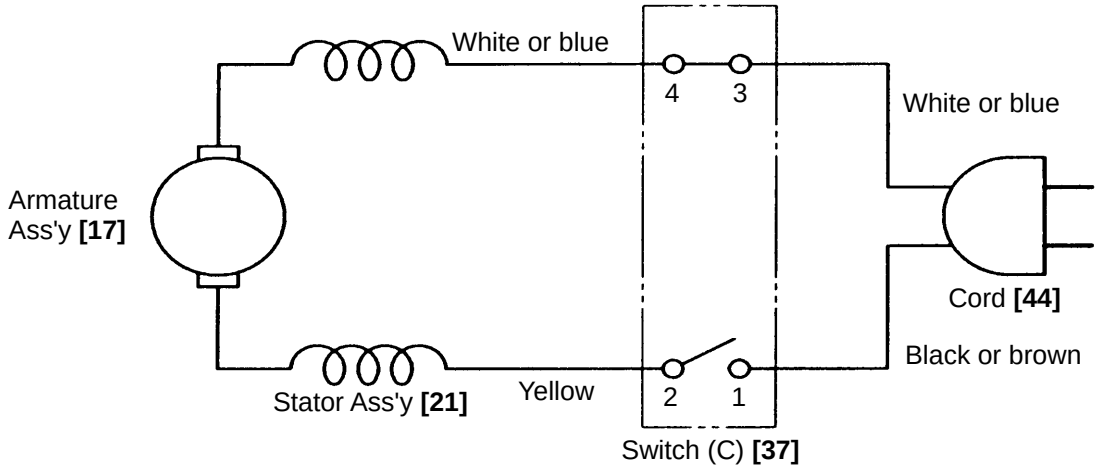
1-5. Tightening Torque

D4 Tapping Screw (W/Flange) **[30] [41]** ..... 2.0 ± 0.5 N·m (20 ± 5 kgf·cm, 1.5 ± 0.4 ft-lbs)

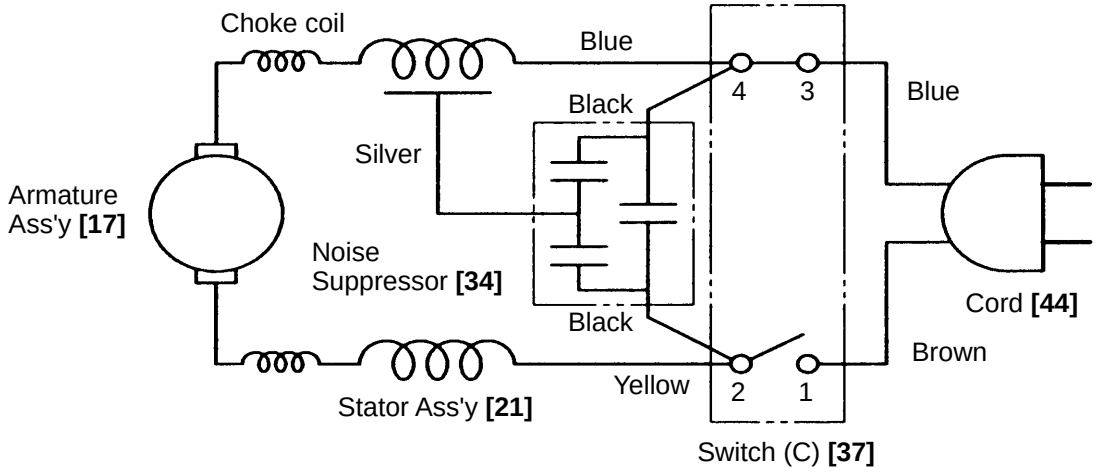
D5 Tapping Screw **[7]**
D5 Hex. Hd. Tapping Screw **[31]** ..... 2.9 ± 0.5 N·m (30 ± 5 kgf·cm, 2.2 ± 0.4 ft-lbs)

1-6. Wiring Diagrams

For the U.S.A., Canada and Asian countries (except China)



For European countries and China



1-7. Insulation Tests

On completion of reassembly after repair, measure the insulation resistance and conduct the dielectric strength test.

Insulation resistance: 7 MΩ or more with DC 500V Megohm Tester

Dielectric strength: AC 4,000 V for 1 minute, with no abnormalities ····· 220 V – 230 V

AC 2,500 V for 1 minute, with no abnormalities ····· 110 V – 127 V

1-8. No-Load Current Values

After no-load operation for 30 minutes, the no-load current value should be as follows.

Voltage (V)	110	115	220	230
Current (A) max.	2.5	2.6	1.5	1.5

2. STANDARD REPAIR TIME (UNIT) SCHEDULES

MODEL	Variable / Fixed	10	20	30	40	50	60 min.
SP 18SA		Work Flow					
	General Assembly	Switch Cord	Armature Ball Bearing (6000DD) Ball Bearing (608VV) Dust Seal Inner Cover	Housing Stator			
			Gear Cover First Gear Ball Bearing (6201DD) Spindle Bearing Cap Ball Bearing (608VV) Second Pinion Final Gear				